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Observations on the biology of the Australian beetle *Leperina cirrosa* PASCOE (Coleoptera: Trogossitidae)

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Abstract

Observations are provided on the biology of Leperina cirrosa *PASCOE (Trogossitidae). The larvae and/or adults have been collected by the author over the past 8 years from the dead wood of* Delonix regia *(BOJ. ex HOOK.) RAF. (Caesalpiniaceae),* Acacia bidwillii *BENTH.,* A. leiocalyx *(DOMIN.) PEDLEY and* A. sophorae *(LABILL.) R. BR. (Mimosaceae). There is also some evidence that the larvae of* L. cirrosa *are carnivorous on the larvae and pupae of other Coleoptera (and possibly Lepidoptera) co-inhabiting the dead* Acacia *wood.*

Introduction

Leperina cirrosa PASCOE (Fig. 1) is a distinctive trogossitid beetle from coastal Queensland and New South Wales, Australia (HAWKESWOOD, 1987: 79). The general body colour of the adult is dark brown to brownish-black, with the upper body surface and head covered with patches of white, brown and black scales, while the expanded lateral margins of the pronotum are densely clothed with large patches of long, shiny white scales (see illustrations in MCKEOWN, 1948: 269 and HAWKESWOOD, 1987: 184, plate 111). The adults usually measure 12-14 mm long (HAWKESWOOD, 1987). The species was first described by PASCOE (1860: 100-101) from "Australia (Moreton Bay)" (Brisbane, Queensland) but biological details were not provided. The only previously published data on the biology and habits of *L. cirrosa* appear to be the brief notes of HAWKESWOOD (1987: 79) who noted that adults and larvae are found under the bark of trees or in the tunnels of wood-boring beetles (in the sapwood and/or heartwood) and the record of HOCKEY and DE BAAR (1988: 160) who collected two adults during 1985 from the dead branches of *Avicennia marina* (FORSK.) VIERH. (Avicenniaceae) at Port Alma, Queensland (25°35'S, 150°52'E). The larva of *L. cirrosa* is also illustrated by HAWKESWOOD

(1987: 183, plate 110). The following data summarizes my field experiences with this beetle from 1983 to the present time.

Observations

During January 1983, I collected a live adult from underneath the loose, dead, exfoliating bark of *Acacia leiocalyx* (DOMIN) PEDLEY (Mimosaceae) near Kingston, a southern suburb of Brisbane, Queensland. Several early instar larvae, possibly belonging to this species, were also dissected from well decayed portions of the branch later in the laboratory. The site where the *Acacia leiocalyx* bushes were growing have since been cleared for residential and industrial development. (This is most unfortunate since the area was biologically diverse despite being a disclimax community and several rare Buprestidae and Cerambycidae were collected at this site, HAWKESWOOD, unpubl. data). With regard to the *L. cirrosa* larvae (presumed) collected from *A. leiocalyx*, it is possible that they fed on the larvae and pupae of *Ancita marginicollis* (BOISDUVAL) (Cerambycidae) and other longicorn beetles which were also found abundantly in the wood.

During November 1983, I was presented with some dead main stems of *Delonix regia* (BOJ. ex HOOK.) RAF. (Caesalpiniaceae) from the Ipswich area, Queensland (27°36'S, 152°47'E). Careful dissection of the timber yielded a number of beetles, including one specimen of *L. cirrosa*, which was resting in a channel of wood-boring beetle, possibly that of *Aridaeus thoracicus* (DONOVAN) (Coleoptera: Cerambycidae) which was also collected commonly from the timber (HAWKESWOOD, 1985).

During October 1987, I obtained (through the courtesy of Mr Paul FORSTER of Brisbane), a large number of dead branches and stems of *Acacia bidwillii* BENTH. (Mimosaceae) from 11 km west of Degilbo, Queensland (25°28'S, 151°53'E). Careful dissection of these branches and stems revealed that the dead, dry wood had been greatly infested with the larvae and adults of *Platyomopsis pulverulens* (BOISDUVAL) (Cerambycidae), *Chlorophorus curtisi* (LAPORTE & GORY) (Cerambycidae) (see HAWKESWOOD & DAUBER, 1990) and *Euthyrhinus meditabunduns* (FABRICIUS) (Curculionidae) (see HAWKESWOOD, 1991). One adult of *L. cirrosa* was collected from under the thick bark of a branch where it was covered with fine wood powder, presumably the result of feeding by early instar larvae of the Cerambycidae.

On 15 February 1990, I collected one larva and one adult of *L. cirrosa* from underneath the dead bark of a dead branch (3.8 cm in diameter) of *Acacia sophorae* (LABILL.) R. BR. (Mimosaceae) at Hastings Point, New South Wales (28°20'S, 153°35'E). During 1987-1991, I dissected a considerable amount of dead wood material of *A. sophorae* from Hastings Point but the only material I managed to obtain was the material mentioned above.

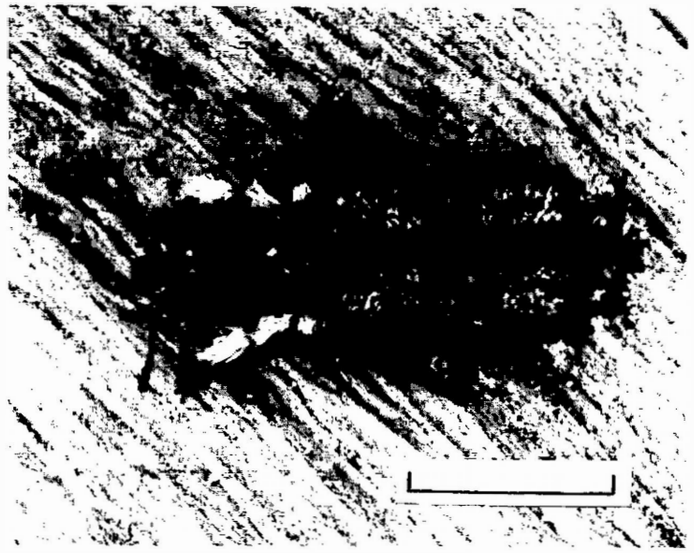

Fig. 1. Adult of *Leperina cirrosa* PASCOE (Trogossitidae) from the Ipswich area, Queensland. Scale line= 5 mm. (Photo T.J. HAWKESWOOD).

Comments

MCKEOWN (1948: 267) in general comments on the family, noted that adult beetles of Trogossitidae, "are to be found hiding by day under bark flaking from the trunks of trees", with their larvae frequenting decaying wood. MCKEOWN (1948) also noted "in both stages they are usually considered to be 'predaceous'[sic] but this statement is largely unsupported by direct evidence". In the material I have personally collected since 1983, I have not witnessed trogossitid larvae actually feeding on the larvae of other Coleoptera but they have all been situated in or near the tunnels chewed out by the borers, and *Leperina* do not appear to be borers themselves.

CROWSON (1964) found insect fragments, detrital and fungal material in the gut of *Leperina* sp. adults from New Zealand, although earlier, HUDSON (1934) stated that larvae of *Leperina* fed on the solid wood of various small trees. MAY (1965) stated that *Leperina farinosa* SHARP from New

Zealand was a highly efficient predator and inferred that this beetle fed on the larvae of the weevil *Aldonus hylobioides* WHITE (Curculionidae) in dead wood of *Metrosideros excelsa* SOL. ex GAERTN. (Myrtaceae). Adults and larvae of *L. farinosa* both feed in the same manner, by piercing the larval cuticle of their prey, sucking out the body fluids, and later, chewing the remains, except for the head capsules (MAY, 1965). Species of *Leperina* are apparently general predators on lignicolous larvae, and larvae of other weevil species and cerambycids (longicorn beetles), were also readily devoured in captivity by both *L. farinosa* and *L. nigrosparsa* WHITE (MAY, 1965). CROWSON (1992, pers. comm.) re-examined the gut contents of four adults of *Leperina* species from New Zealand and found that the gut of the male contained solely insect fragments, that one female with an almost empty gut contained two probable insect fragments, and that the remaining two females with well-filled guts contained no visible insect fragments but mainly fibrous vegetable and fungal material; one large larva of *Leperina* from New Zealand had its gut full of mainly vegetable material with no evidence of insect fragments. With this information in mind, it is indeed probable that *L. cirrosa* larvae are carnivorous, or at least carnivorous for most of their development to the pupal stage. Also, it does appear that although insect larvae are consumed by both *Leperina* larvae and adults, that fungi and some wood material are consumed as supplementary food items. Clearly, further study of gut contents of *Leperina* and related beetles would add significantly to the present limited knowledge on this subject.

If we accept that *Leperina* adults and larvae are not wood-borers as originally stated by earlier workers such as HUDSON (1934), then it is clear that *Leperina* adults and larvae are only able to attack the larvae/pupae of the host insects by moving through the hollow tunnels/pupal chambers to reach them. However, many of these tunnels/chambers will be sealed securely and therefore not accessible to *Leperina*, while others will not contain any larvae or pupae. Hence, starvation could always be a problem for such beetles which are not adapted to an obligate phytophagous existence like their prey such as the Cerambycidae (longicorn beetles) and Curculionidae (weevils). This may explain the apparent rarity (i.e. low population numbers) of *Leperina* in the dead, beetle-infested timber, in comparison to the high density of other beetles in the same wood. However, CROWSON (1981: 332) noted that predatory beetles do not locate their food over any considerable distance, and rely on habitat selection to bring them into the "proximity" of suitable prey, although there is evidence that some adult Cleridae and Trogossitidae may react to the aggregative pheromones of their bark-beetle prey. This may be one important adaptation in reducing the amount of energy consumed in prey location. It would be interesting to determine if this is the case with *L. cirrosa* and other *Leperina* species but the apparent rarity of these beetles may prevent these sorts of observations to be made or cause data to be slow in forthcoming.

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